SUBSCRIPTIONS FOR 1929 NOW PAYABLE.

MARCH, 1929

ENTOMOLOGICAL NEWS

Vol. XL No. 3

EZRA TOWNSEND CRESSON
1838–1926

THE AMERICAN ENTOMOLOGICAL SOCIETY

CONTENTS

Gunder—North American Institutions Featuring Lepidoptera—Plate II.. 67
Knight—Descriptions of Five New Species of Plagiognathus from North America (Hemip.: Miridae). 69
Blatchley—Two New Heteroptera from Southern California (Cydnidae, Nabidae) 74
Hallock—North American Predacious Insects Attacking Japanese Beetle Grubs (Popillia japonica Newman) 76
Dr. H. B. Hungerford. 78
Crosby—Studies in North American Spiders: the Genus Cochlembolus (Araneina) 79
Frost—Notes on Pennsylvania Ortalidae (Dipt.) 84
Randolph—A Calendar of Kansas Butterflies. 88
Knight—Entomology in the Literary Supplements 92
Entomological Literature 93
Doings of Societies—Chicago Entomological Society 98
Obituary—Prof. Edwin Eddy Calder, Dr. Harrison Gray Dyar. 99

PHILADELPHIA, PA.
THE ACADEMY OF NATURAL SCIENCES.
Logan Square

Entered at the Philadelphia, Pa., Post Office as Second Class Matter.
Acceptance for mailing at the special rate of postage prescribed for in Section 7
Act of October 3, 1917, authorized January 15, 1921.

ENTOMOLOGICAL NEWS

published monthly, **excepting August and September,** by The American Entomological Society.

Philip P. Calvert, Ph.D., Editor; E. T. Cresson, Jr., R. G. Schmieder, Ph.D., Ernest Baylis, Associate Editors; John C. Lutz, Business Manager.

Advisory Committee: Philip Laurent, J. A. G Rehn, Chas. Liebeck, J. Chester Bradley, Ph.D., Frank Morton Jones, John C. Lutz, Max Kisliuk, Jr.

The subscription price per year of ten (10) numbers is as follows:

United States and possessions . .	**$3.00**
Canada, Central and South America .	**3.15**
Foreign	**3.25**

Single copies 35 cents. Sample copies 50 cents.

ADVERTISING RATES: Full width of page. Payments in advance.
One issue, 1 in., $ 1.20, 2 in., $ 2.40, half page, $ 4.00, full page, $ 8.00
Ten issues " 11.00, " 20.00, " 35.00, " 70.00

SUBSCRIPTIONS. All remittances and communications regarding subscriptions, non-receipt of the NEWS or of reprints, and requests for sample copies, should be addressed to

JOHN C. LUTZ, 6623 Lansdowne Ave., PHILADELPHIA, PA.

All complaints regarding non-receipt of issues of the NEWS should be presented within three months from date of mailing of the issue. After that time the numbers will be furnished only at the regular rate for single copies. Not more than two issues will be replaced gratis, through loss in transit or in change of address, unless such have been registered, at the subscriber's expense. No subscriptions accepted which involve giving a receipt acknowledged before a notary, except at the subscriber's expense.

MANUSCRIPTS AND ADVERTISEMENTS. Address all other communications to the editor, Dr. P. P. Calvert, Zoological Laboratory, University of Pennsylvania, Philadelphia, Pa.

TO CONTRIBUTORS. All contributions will be considered and passed upon at our earliest convenience and, as far as may be, will be published according to date of reception. The receipt of all papers will be acknowledged. Owing to the limited size of each number of the NEWS, articles longer than six printed pages will be published in two or more installments, unless the author be willing to pay for the cost of a sufficient number of additional pages in any one issue to enable such an article to appear without division.

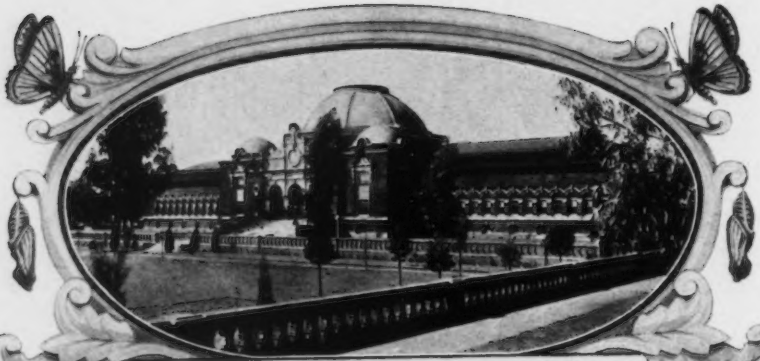
Proof will be sent to authors. Twenty-five "extras" of an author's contribution, without change in form and without covers, will be given free when they are wanted; if more than twenty-five copies are desired *this should be stated on the MS.*

Owing to increased cost of labor and materials, no illustrations will be published in the NEWS for the present, except where authors furnish the necessary blocks, or pay in advance the cost of making blocks and pay for the cost of printing plates. Information as to the cost will be furnished in each case on application to the Editor. Blocks furnished or paid for by authors will, of course, be returned to authors, after publication, if desired.

Stated Meetings of The American Entomological Society will be held at 7.30 o'clock P. M., on the fourth Thursday of each month, excepting June, July, August, November and December, and on the third Thursday of November and December.

Communications on observations made in the course of your studies are solicited; also exhibits of any specimens you consider of interest.

The printer of the "News" will furnish reprints of articles over and above the twenty-five given free at the following rates: One or two pages, twenty-five copies, 35 cents; three or four pages, twenty-five copies, 70 cents; five to eight pages, twenty-five copies, $1.40; nine to twelve pages, twenty-five copies, $2.00; each half-tone plate, twenty-five copies, 30 cents; each plate of line cuts, twenty-five copies, 25 cents; greater numbers of copies will be the corresponding multiples of these rates.



LOS ANGELES MUSEUM. LOS ANGELES, CALIFORNIA.

PROF. L. J. MUCHMORE DR. J. A. COMSTOCK

ENTOMOLOGICAL NEWS

VOL. XL. MARCH, 1929 No. 3

North American Institutions Featuring Lepidoptera.

II. The Los Angeles Museum, Los Angeles, California.

By J. D. GUNDER, Pasadena, California.

(Plate III.)

One of the most imposing buildings in Exposition Park, Los Angeles, is the Museum of History, Science and Art. This Museum was formally opened on November 6, 1913, under county financial supervision. Within the last eight years the present structure (illustrated) has become inadequate, so about two years ago a major building program was begun, of which two units have been constructed and which, when finally completed, will make this Museum one of the largest in the United States. The new buildings will have approximately thirteen times the present ground area and will cost over ten million dollars. The construction is of the most approved type, reinforced concrete throughout, and with adequate facilities for modern display and research.

Although the Museum's activities cover the three fields of art, science and history, its most outstanding collection, from the viewpoint of international interest, is that of the pleistocene remains recovered from the La Brea asphalt beds which are within the city limits. It is estimated that this collection contains more bone material than is found in all the combined museums of the world.

Of interest to entomologists is the collection of insect remains found in the La Brea pits. Of course, the crude asphalt has not preserved any Lepidoptera, but occasionally beetles and other hard shelled insects are found in fair condition.

The Museum, as a whole (including also the Otis Art Institute and Hancock Park), is under the direction of Mr. William Bryan, well known as a museum executive and connoiseur of art. Before assuming the directorship of the Los Angeles Museum, Mr. Bryan had filled numerous posts in public service,

ENTOMOLOGICAL NEWS.
ACAD. NAT. SCI.
PHILADELPHIA, PENN'A.

including a curatorship with the Bishop Museum of Honolulu. He has been ably supported in the phenomenal expansion and development of the Los Angeles Museum by the County Board of Supervisors. The associate directorship of the Museum is held by Dr. John A. Comstock, formerly director of the Southwest Museum (Los Angeles), and all departments of Natural Science are under his personal guidance.

Prof. L. J Muchmore is in charge of the entomological department and except for the Lepidoptera which are under the supervision of Dr. Comstock, all other insects are in his care. Mr. Muchmore has been engaged for the last few years in bringing the Coleoptera material up to date. The collections of Lepidoptera include those of Daggett, Herr, Albright, Cooledge (Heterocera only), and the recently acquired Comstock collections.

Dr. Comstock is well known for his work on western diurnal Lepidoptera and for his recently published book, "The Butterflies of California", which has taken the place of the older publication, W. G. Wright's "Butterflies of the West Coast". Dr. "J. A." was born Jan. 30, 1883, in Evanston, Illinois, and attended public high school there. He received his M. A. at Occidental College, Los Angeles, and his medical degree through the College of Ost. Phys. & Surg, also in Los Angeles.

Since 1920, he has been editor of the "Bulletin of the So. Calif. Acad. of Sciences". He began collecting about 1895 and with his brother, Hurd Comstock, first attended an entomological meeting in Chicago.

The Entomological Department of the Los Angeles Museum is housed on the third floor of the second new unit and occupies three spacious rooms. Types are at present incorporated in the general collection, but will eventually be segregated in separate steel cabinets. A display collection of insects, chiefly Lepidoptera, is one of the museum features and is used extensively by visiting teachers and classes.

The Lorquin Entom. Society is affiliated with the Museum and holds monthly meetings in the main building. This organization was founded by Fordyce Grinnell and was for a time working in association with the Southwest Museum, but when

that institution decided to limit its field to anthropology, the Society transferred its interests to the Los Angeles Museum. Once each year in February this Club sponsors a "Butterfly Show" which is held in the Museum and creates much public interest and press comment. This year the 8th Annual Exhibit will be held.

The Museum buildings are only a short distance from the giant Los Angeles Stadium in which will be centered most of the activities of the Olympic Games in 1932. At that time it is hoped that many entomologists will take the opportunity of visiting Los Angeles, and to these the Museum extends a most cordial invitation of welcome.

Descriptions of Five New Species of Plagiognathus from North America (Hemip.: Miridae).*

By HARRY H. KNIGHT, Ames, Iowa.

Plagiognathus salicicola n. sp.

Runs to *delicatus* Uhler in my key (Hem. Conn., 1923, p. 433), but easily distinguished by the larger size and black color markings; cuneus black with all margins pale.

♂. Length 4.1 mm., width 1.5 mm. Head: width .83 mm., vertex .33 mm.; pale, tylus and lora black, arcuate mark each side of frons and spot each side above, fuscous. Rostrum, length 1.4 mm., extending upon middle of hind coxae, fuscous at the joints. Antennae: segment I, length .27 mm., black, apex pale; II, 1.09 mm., pale, base and apex blackish; III, .77 mm., pale to dusky; IV, .45 mm., dusky. Pronotum: length .65 mm., width at base 1.26 mm.

Clothed with pale to yellowish simple pubescence, suberect and moderately prominent. Color blackish, anterior margin of pronotum, disk behind calli, lower half of propleura, scutellum except on base, along claval suture and radial vein, embolium, all margins of cuneus, xyphus, sides of sternum, epimera, and apical area of genital segment, pale to yellowish. Legs pale, basal half of coxae largely fuscous, double row of spots on femora, also apically on posterior aspect, knees, spots and spines on tibiae, black.

♀. Length 3.9 mm., width 1.7 mm; very similar to the male in pubescence and coloration but the dorsum somewhat more broadly pale.

*Contribution from the Department of Zoology and Entomology, Iowa State College, Ames, Iowa.

Holotype: ♂ July 17, 1927, St. Mary's, OHIO (S. A. Watson); author's collection. *Allotype*: July 13, 1920, Berrien Co., MICHIGAN (R. F. Hussey), collected on Salix. *Paratypes*: ♂, 2♀, July 19, 1925, Ledges State Park, Boone, IOWA (H. H. Knight), taken on *Salix longifolia.*

PLAGIOGNATHUS SALICICOLA **depallens** n. var.

Similar in structure to *salicicola* but differs in the pale color; dorsum uniformly pale, without distinct fuscous markings altho the membrane is fuscous; antennae infuscated like the typical form but the legs with spotting somewhat reduced; hind femora with a spot on middle and a group of smaller spots on apical half.

Holotype: ♂ August 2, 1924, St. Anthony Park, St. Paul, MINNESOTA (H. H. Knight); author's collection. *Paratypes*: 5♀, taken with the type on *Salix* sp. 12♂ ♀, July 12, 1919, Hennepin Co., Minnesota (H. H. Knight), taken on *Salix longifolia.* ♀ July 8, 1921, St. Paul, Minn. (H. H. Knight), taken at light. 10♂ ♀ July 11, 1923, Red Rock, Ramsey Co., Minnesota (H. H. Knight), on *Salix longifolia.* IOWA—♂ 3♀ July 19, 1925, Ledges State Park, Boone (H. H. Knight), taken on *Salix longifolia* where the species was breeding. 2♂ July 26, 1928, Ames, Iowa (H. H. Knight), on *Salix longifolia.*

PLAGIOGNATHUS TINCTUS Knight.

This species was originally described as a variety of *P. albonotatus* Kngt. (Hem. Conn., 1923, p. 437), but with the accumulation of considerable material since 1923, it is evident that *tinctus* is a valid species. We have found it breeding on sand bar willow (*Salix longifolia*), the same host as the above described *salicicola* but it may be readily separated by the fuscous to blackish scutellum combined with a pale to reddish cuneus.

Debilis Blatchley is a color form of *tinctus* Kngt., it being the common phase of the species in the Mississippi valley region. I found it particularly abundant in Minnesota breeding on sand bar willow. Typical *tinctus* has reddish appearing in the pale cuneus and occurs as might be expected, in the cooler and higher elevations of its range, especially Pennsylvania, but I have also taken it in Minnesota.

Plagiognathus shepherdiae n. sp.

Pale and marked with black; color pattern suggestive of *Phyllopidea picta* (Uhl.) but distinguished by the longer rostrum and soft pale pubescence.

♂. Length 4.5 mm., width 1.6 mm. Head: width .87 mm., vertex .38 mm. Rostrum, length 1.38 mm., reaching upon middle of hind coxae. Antennae: segment I, length .30 mm., pale, base and two setigerous points on apical half black; II, 1.27 mm., pale to greenish yellow, base and more widely on apex blackish; III, .77 mm., fuscous; IV, .42 mm., fuscous. Pronotum: length .64 mm., width at base 1.29 mm.

Clothed with soft pale pubescence. Ground color pale to yellowish, four spots on front of vertex, transverse marks each side of frons, apex and bivittate mark on basal half of tylus, tip of rostrum, calli, more or less transversely on basal half of pronotal disk and sometimes extending forward to outer margin of callus, middle of mesoscutum and sometimes extending on base of scutellum, clavus except rather broadly along claval vein, claval suture, corium except rather broadly along radial vein and extending to apex, central area of cuneus, coxal cleft above, central area of propleura, sternum, and venter more or less, fuscous to black. Legs pale, anterior aspect of femora with double row of prominent spots, posterior aspect also with incomplete rows, and dorsal margin with line on apical half, black; knees, tibial spines and spots at base also black. Membrane fuscous, paler bordering the white veins.

♀. Length 4 mm., width 1.6 mm. Head: width .83 mm., vertex .41 mm. Antennae: segment I, length .29 mm.; II, .98 mm.; III, .61 mm.; IV, .37 mm. Pronotum: length .62 mm., width at base 1.24 mm. More robust than the male but very similar in coloration; membrane paler, the heavy infuscation reduced to an irregular transverse band, and between and within the central areas of larger areoles.

Holotype: ♂ August 12, 1925, Pagosa Springs, COLORADO (H. H. Knight); author's collection. *Allotypes* same data as type. *Paratypes*: 22 ♂ ♀, taken with the types on buffalo berry (*Shepherdia argentea* Nutt.) on which the species was breeding. 11 ♂ ♀ Aug. 13, 1925, Mancos, Colorado (H. H. Knight), taken on the same host.

PLAGIOGNATHUS SHEPHERDIAE **flavidus** n. var.

Very similar in structure to *shepherdiae* but differs greatly in color aspect; uniformly pale, antennae and legs marked with black as in *shepherdiae* but without black line forming above on femora; frons above with four dusky spots but other markings obsolete; cuneus sometimes dusky on middle, membrane uniformly pale fumate. Clothed with soft pale pubescence.

♂. Length 3.8 mm. Head: width .86 mm., vertex .385 mm. Antennae: segment I, length .29 mm.; II, 1.15 mm.; III, .74 mm.; IV, .45 mm. Pronotum: length .59 mm., width at base 1.21 mm. Female very similar to the male in size and coloration.

Holotype: ♂ July 24, 1927, Kennebec, SOUTH DAKOTA (H. H. Knight); author's collection. *Allotype*: same data as type. *Paratypes*: 16 ♂ 22 ♀, taken with the types on buffalo berry (*Shepherdia argentea* Nutt.), but the fruit of these plants was yellow and not dark red like the Colorado plants which have been determined as the same species.

It seems rather significant that not a single specimen of the good series obtained, varies toward the dark color pattern of the typical *shepherdiae* from Colorado. Perhaps the form here described represents a race or subspecies, but it will take time and more work before we can be sure of the status of such closely related forms.

Plagiognathus luteus n. sp.

Distinguished by the uniformly orange-yellow color; first antennal segment, base and apex of segment II, line on dorsal margin of apical half of hind femora, knees and spots on tibiae, black; membrane uniformly pale fumate, veins of the same deep orange-yellow as the corium and cuneus. Tibial spines fuscous to black; tarsi apically, last two antennal segments and tip of rostrum, fuscous.

♂. Length 3.8 mm., width 1.3 mm. Head: width .70 mm., vertex .31 mm. Rostrum, length 1.3 mm., reaching to middle of hind coxae. Antennae: segment I, length .26 mm.; II, 1.12 mm.; III, .59 mm.; IV, .33 mm. Pronotum: length .52 mm., width at base 1.06 mm.

♀. Length 3.2 mm., width 1.5 mm. Head: width .68 mm., vertex .34 mm. Antennae: segment I, length .25 mm.; II, .95 mm.; III, .52 mm.; IV, .31 mm. Pronotum: length .49 mm., width at base 1.1 mm. Very similar to the male in coloration and pubescence.

Holotype: ♂ June 12, 1925, Williams, ARIZONA (A. A. Nichol); author's collection. *Allotype*: same data as the type. *Paratypes*: 16 ♂ 1 ♀, taken with the types on *Berberis fremontii* which is the host plant. Mr. Nichol states: "Recalling the yellow species of which there was a good series taken on

barberry at Williams, it may be of interest to know that the color of the flower and insect not only closely agreed, but the outer layer of the cambium is also that shade of yellow."

Plagiognathus tenellus n. sp.

Distinguished by the uniformly pale yellowish color, rather broad head and prominent eyes. Antennae yellowish brown, last two segments dark brown to fuscous. Hind femora with five or six setigerous fuscous dots subapically on anterior face; tibial spines prominent, black, with small fuscous spots at base. Membrane unformly pale fuscous. Clothed with prominent, simple, pale yellowish pubescence. Left genital clasper rather prominent for the genus, forming a small lobe distally, the dorsal margin forming an arcuate line.

♂. Length 3.8 mm., width 1.4 mm. Head: width .89 mm., vertex .31 mm. Rostrum, length 1.14, scarcely attaining hind margins of middle coxae. Antennae: segment I, length .25 mm.; II, 1.2 mm.; III, .86 mm.; IV, .35 mm. Pronotum: length .61 mm., width at base 1.27 mm.

♀. Length 3.6 mm., width 1.6 mm. Head: width .86 mm., vertex .40 mm. Antennae: segment I, length .24 mm.; II, 1.03 mm.; III, .80 mm.; IV, .41 mm. Pronotum: length .59 mm., width at base 1.3 mm. Very similar to the male in pubescence and coloration.

Holotype: ♂ August 2, 1917, top of Bright Angel trail, Grand Canyon, ARIZONA (H. H. Knight); author's collection. *Allotype*: taken with the type. *Paratypes*: 12 ♂ ♀, taken with the types. 36 ♂ ♀ June 20, 1928, alt. 6200 ft., Chiricahua Mts., ARIZONA (A. A. Nichol). Mr. Nichol reports the species as breeding on *Philadelphus rugosus*.

Plagiognathus phoradendronae n. sp.

Pale greenish yellow, more greenish on thorax, hemelytra yellowish translucent, tinged with dusky apically on corium. Membrane pale, anal area, apically within areoles, and transverse cloud just behind areoles, dusky to fuscous. Legs unspotted, tibial spines pale to yellowish. Head rather short and broad for the genus.

♂. Length 2.8 mm., width 1.2 mm. Head: width .74 mm., vertex .33 mm. Rostrum, length .83 mm., just attaining hind margins of intermediate coxae. Antennae: segment I, length .16 mm.; II, .90 mm., thickness about equal to segment I, clothed with rather prominent fuscous pubescence; III, .40 mm.; IV, .35 mm.; greenish yellow, last two segments becom-

ing fuscous. Pronotum: length .47 mm., width at base 1.06 mm.

♀. Length 2.8 mm., width 1.2 mm. Head: width .71 mm., vertex .37 mm. Antennae: segment I, length .16 mm.; II, .75 mm.; III, .41 mm.; IV, .29 mm. Pronotum: length .445 mm., width at base 1.03 mm. Very similar to the male in coloration and pubescence.

Holotype: ♂ June 20, 1928, Chirichaua Mts., ARIZONA (A. A. Nichol); author's collection. *Allotype*: same data as the type. *Paratypes*: 18 ♂ ♀, taken with the types on mistletoe (*Phoradendron macrophyllum*) where the species was breeding.

Two New Heteroptera from Southern California (Cydnidae, Nabidae).

By W. S. BLATCHLEY, Indianapolis, Indiana.

Among the 100 and more species of Heteroptera taken by the writer in the vicinity of Los Angeles, California, between November 25, 1927, aand March 15, 1928, were four which are apparently new to science. Two of these, belonging to the family Lygaeidae, will soon be described by Prof. H. G. Barber. The other two are described in the present paper. The types of both are in the writer's collection.

Pangaeus californicus, n. sp.

Broadly oval, subdepressed. Dark chestnut-brown to piceous-black; membrane whitish-hyaline; tarsi and joints 4 and 5 of antennae pale reddish-brown. Head declivent, as broad across eyes as front margin of pronotum, without an anteapical spine-beset groove; cheeks each with four or five erect bristles and two broad sub-transverse ridges, the intervals between the ridges very finely indistinctly punctate; vertex almost smooth. Beak reaching middle coxae. Antennae reaching basal third of pronotum; joint 1 cylindrical; 2 more slender, subclavate, one-fourth longer than 3, the latter stouter, also subclavate; 4 and 5 still stouter, subfusiform, densely clothed with fine very short yellowish pubescence, 4 slightly the longer. Pronotum with the usual subapical transverse impression of the genus very feeble and without visible punctures at middle; submedian transverse impression also ill defined and with a single irregular row of fine punctures; disk of pronotum otherwise almost smooth, the front lobe the more convex; front

angles broadly rounded, hind angles subrectangular, side margins each with 9 or 10 erect, evenly spaced bristles. Scutellum a nearly equilateral triangle, its sides strongly converging from base to the narrowly rounded apex; disk with basal third smooth, feebly elevated, apical two-thirds coarsely, sparsely irregularly punctate. Elytra with membrane slightly surpassing tip of abdomen; costal margins of basal half each with three bristle-bearing punctures; outer margin of clavus with a single regular row of coarse punctures, these obsolete toward apex; corium with a single row of finer punctures along inner margin and a few irregular ones on basal third, otherwise wholly smooth. Under surface dark chestnut-brown, smooth, strongly shining. Length, 9.3-10 mm.; width, 4.8-5 mm.

Type a female taken January 10, 1928, from beneath a stone in a small semi-desert area near Sunland, Los Angeles County, CALIFORNIA. Other unnamed specimens are in the Museum of the California Academy of Sciences labelled "San Diego, Cal., IV-8 and Coldwater Canyon, Los Angeles Co., Cal., X-4." This species is most closely allied to *P. discrepans* Uhl., from which it differs in its larger size, lack of punctures or distinct groove behind apex of pronotum, much fewer and more regularly placed bristles on cheeks and along side margins of pronotum and elytra, smoother disks of pronotum and corium, etc. The length of *discrepans* is 6.5-8 mm.; there are on head about 10 erect bristles on each cheek, 18 or 20 similar bristles along each side margin of pronotum and 7 to 9 on each costal margin of elytra; the corium there has two rows of punctures along inner margin and numerous much smaller punctures scattered irregularly over the entire surface.

P. discrepans, and especially *californicus,* differ from *P. bilineatus* (Say), our most widely distributed and best known species, in the vagueness or absence of the anteapical groove of pronotum, and the generic keys at present extant in North American literature in which the presence of this groove is the primary character used, will either have to be modified or a new genus erected for these two species.

Nabis edax n. sp.

Elongate, slender. Color a nearly uniform bright straw-yellow, moderately shining; a stripe on sides of head behind the eyes, collar and a very narrow median stripe on pronotum,

median stripe slightly widened posteriorly on scutellum, extreme tip of commissure, and a stripe on the side of mesosternum, purplish-black; membrane slightly dusky, a very small fuscous spot on the margins each side of middle; outer face of hind femora with a row of minute fuscous dots; tarsal claws piceous. Antennae very slender, minutely bristly-pubescent, joint 1 as long as head, 2 twice as long as 1, one-fifth longer than 3, its tip fuscous; 4 two-fifths the length of 3. Pronotum subcampanulate, the postapical and submedian constrictions broad but prominent, surface smooth. Elytra with sides parallel to apical fourth, thence curved into the broadly rounded tips; commissure and apex of corium subequal in length, the latter straight, diagonal, longer than scutellum; disk of elytra minutely, indistinctly rather sparsely pubescent. Connexivum narrowly exposed, the incisures between the segments each with a very small fuscous spot. Membranes slightly surpassing tip of abdomen. Femora unarmed beneath; hind ones very slender, one-half longer than middle pair. Abdomen thickly, very finely pubescent. Genital segment of male scoop-shaped and with a broad median lengthwise groove. Length, 6.5 mm.; width, 2 mm.

Type a male, taken December 6, 1927, by sifting debris beneath a pile of matted grass in Hancock Park, Los Angeles, CALIFORNIA. Differs from all our other described species in its nearly uniform pale color, relative length of the very slender antennal segments, etc.

North American Predacious Insects Attacking Japanese Beetle Grubs (Popillia japonica Newman).

(Coleop.: Scarabaeidae, Carabidae; Dipt.: Tabanidae, Therevidae, Asilidae.)*

By HAROLD C. HALLOCK, Associate Entomologist, U. S. Dept. of Agri., Bureau of Entomology.

There has been considerable doubt as to whether North American insects were helping to reduce the numbers of the Japanese bettle in this country. In order that this question might be answered, at least in part, extensive surveys were made during the seasons of 1923 to 1925, inclusive. The work

*Contribution No. 49, Japanese Beetle Research Laboratory, Moorestown, New Jersey.

reported in this paper was confined to a few species of Carabidae, Tabanidae, Asilidae, and Therevidae, in their relationship to Japanese beetle grubs.

During the three years mentioned, work was done at ten locations near the Japanese Beetle Laboratory in the center of the infested area. These stations were about one mile apart, and were all in meadow land. At each station several plots of one foot square were examined to a depth of eight inches about once a week, and the insect population noted. As examinations of plots farther from the Laboratory but within the infested area revealed insect populations similar to those of the ten stations, further work was carried on only at the latter. All predacious insects found which might be connected with the reduction of the numbers of Japanese beetles were reared in the Laboratory, and Japanese beetle grubs were used as food during the rearing of these insects.

Coleoptera.

Carabidae. The larvae of *Harpalus pennsylvanicus* DeG. were found throughout the central Japanese beetle area. Other species of Carabid larvae were observed occasionally, but were never abundant. There was an average of one Carabid larva to every twelve square feet of sod land examined. When placed in soil with a Japanese beetle grub, the *H. pennsylvanicus* larva immediately attacked the grub, pierced the skin with its mandibles, and made a small hole through which the body fluids were extracted. In captivity the average number of grubs killed and their body fluid consumed was one every two days.

Diptera.

Tabanidae. The larvae of *Tabanus costalis* Wied. were observed from June 15 to August 20 in fairly dry soil. During the spring and fall months they were found only along the edge of streams, but when they became larger in the summer they were observed to occur about one to every 14 square feet of soil examined, as far as 200 feet from the streams. Japanese beetle grubs were also numerous at these localities. *Tabanus costalis* larvae fed readily upon grubs, and reached

the adult stage in captivity even when they were kept in soil that contained only an average proportion of moisture.

Therevidae. The larvae of *Psilocephala haemorrhoidalis* Macq. are very hardy and are easily reared in captivity. They were found throughout the central Japanese beetle area, and occurred at the rate of about one to every five square feet of soil examined. The Therevid larvae attack grubs very readily, and in several cases were observed to puncture the skin of a grub with their mandibles and to insert the head in the wound so that they could obtain the body fluids. In captivity they killed more grubs than the Carabids, but they often leave the dead grubs after sucking out only part of the body fluids.

Asilidae. The average number of Asilid larvae in the open field is generally about the same as that of the Therevid larvae, but they are more difficult to rear in captivity than the larvae of either *Tabanus costalis* or *Psilocephala haemorrhoidalis.* The Asilid larvae were very abundant in one field which had been in sod for many years. Thirty-four were found during part of one day while the field was being plowed. Japanese beetle and other Scarabaeid grubs were also plentiful in the same field. Although only a small percentage of the Asilid larvae which were collected reached maturity, several specimens of *Erax aestuans* Linn. and of *Ommatius marginellus* Fab. were reared with Japanese beetle grubs as food.

SUMMARY.

All the insects mentioned are predators, and will undoubtedly feed upon weaker predators as readily as upon herbivorous insects. They do some good, but, so far, they have never been found numerous enough in the field to have any noticeable effect upon the numbers of the Japanese beetle.

Dr. H. B. HUNGERFORD, state entomologist and head of the department of entomology at the University of Kansas, has returned from an eight-months' visit to Europe, as collaborator for the Smithsonian Institution, where he went for the purpose of comparing insects in the University of Kansas collection with the type collections in the older museums of Europe.—*Science,* Jan. 18, 1929.

Studies in North American Spiders: the Genus Cochlembolus (Ananeina).

By C. R. Crosby, Cornell University, Ithaca, N. Y.

(Plate IV.)

COCHLEMBOLUS gen. nov.

Type: *Dismodicus alpinus* Banks.

Related to *Spirembolus* and *Tortembolus* by the spiral form of the tail-piece and middle part of the embolus; distinguished from *Spirembolus* by the cephalic pits in the male and from *Tortembolus* by the shorter apophysis on the tibia of male palpus. The type of this genus was placed by Banks in *Dismodicus* to which it is not closely related. The American representative of *Dismodicus* is, as pointed out by Simon in 1884 (Ar. Fr. 5:568), *Lophocarenum decemoculatum* Emerton, a species very closely related to *D. bifrons* Blackwall, its type.

The first three species here included in the genus have been carefully studied and there is no doubt that they form a closely related natural group. I have also included *Lophocarenum vernale* Emerton, the type of which I studied in the Museum of Comparative Zoology at Cambridge. The drawings of the palpus which I had made at that time clearly indicate its close relationship to the other three species.

Cochlembolus alpinus (Banks).

Dismodicus alpinus Banks. Can. Ent. 28:63, 1896.

Lophocarenum alpinum Emerton. Conn. Acad. Sci. Trans. 14:190, pl. 3, fig. 3, 1909.

Not *Lophocarenum alpinum* Emerton. Conn. Acad. Sci. Trans. 20:150, pl. 2, fig. 7. 1915.

Tortembolus alpinus Crosby, in Chamberlin Calif. Ac. Sci. Proc. 14:115, 1925.

♂. Length, 2 mm. Cephalothorax gray with the cephalic lobe pale, dusky behind. Cephalothorax viewed from above elongate, the sides evenly rounded, round-pointed in front, the clypeus protruding; viewed from the side, gradually ascending and very gently arched over the thorax to the base of the cephalic lobe which is very high, rounded above and leaning forward, clothed above and in front with hairs directed forward and downward. Ocular area and clypeus slanting forward, the latter protruding and strongly convex.

Posterior eyes in a straight line, the median borne under the base of the cephalic lobe, separated by more than the diameter and from the lateral by less than the diameter. Anterior eyes in a very gently procurved line, the median smaller than the lateral and almost touching, separated from the lateral by nearly twice the diameter. Median ocular area convex and thickly clothed with hairs directed forward and downward. Cephalic pits small and placed in deep furrows.

Chelicerae dusky orange yellow. Sternum and labrum nearly black. Endites dusky. Legs pale yellowish. Abdomen gray. Epigastric plates very finely striate.

Femur of palpus rather short and thick, straight. Patella long, nearly straight and almost as thick as the femur. Ratio of length of femur to that of patella as 25 to 16. Tibia rather stout basally, armed above with two strong spines, the dorsal margin armed with two teeth, the mesal one black and strongly incurved, the lateral one broad, thin and quadrate, the two separated by a deep rounded fissure. The cymbium strongly angulate dorsally at base. Paracymbium broad, thin, with a short hook at tip. Bezel very high, thin, semitransparent with a rounded margin. The embolic division of the strongly spiral type. The tail-piece at apex broad and flat, the middle turn apparently doubled, the embolus long and slender making one complete turn around the tip of the bulb.

♀. Length, 2.25 mm. Similar to male but with the head normal. Cephalothorax viewed from above rounded on the sides with a shallow but distinct constriction at the cervical groove, broadly rounded across the front; viewed from the side rather steeply ascending behind and rounded over the head, highest back of the eyes. Clypeus slightly protruding and gently convex. Posterior eyes in a slightly recurved line, equal, separated by a little less than the diameter and a little nearer to the lateral. Anterior eyes in a very gently recurved line, the median smaller than the lateral, almost touching and separated from the lateral by less than the diameter.

Epigynum presents a median hour-glass shaped pale area. On each side of this the integument is thickened and nearly black bearing the openings midway from front to back. On the front margin is a low but distinct black semicircular median tooth formed from the thickened upturned anterior margin of the epigynum.

Type locality. Mt. Washington, N. H.

NEW HAMPSHIRE: Summit of Mt. Washington, 6000 ft., Aug. 19, 1925, 4 ♂ 15 ♀. WYOMING: Summit of Mt. Washburn, Yellowstone Park, 10,300 ft., Aug. 30, 1927, 1 ♂.

Cochlembolus sanctus n. sp.

♂. Length, 1.8 mm. Cephalothorax dusky brown; the clypeus and the eye area paler, the cephalic lobe pale dusky behind, the median line and a diagonal line extending inward and backward from the anterior lateral angle darker. Cephalothorax viewed from above rounded on the sides posteriorly, the sides converging towards the front and slightly concave at the cervical groove, obtusely pointed in front; viewed from the side, rather low and gently ascending to the base of the cephalic lobe where there is a slight depression, cephalic lobe rather high and rounded over the top, highest in front of the middle, the whole face slanting forward, clypeus protruding and strongly convex towards the margin. Cephalic lobe divided by a shallow median groove, clothed in front with hairs directed downward and outward. Cephalic pit small, circular, in a shallow groove.

Posterior eyes in a slightly recurved line, equal, the median separated by less than the diameter and from the lateral by more than the diameter. Anterior eyes in a gently procurved line, the median a little smaller than the lateral, almost touching and separated from the lateral by a little more than the diameter. Chelicerae yellow orange. Sternum and labium dark gray. Endites honey yellow lightly suffused with gray especially across the middle. Legs and palpi light yellow, the coxae dusky below. Abdomen gray. Epigastric plates coarsely striate.

Femur of palpus nearly straight, rather thick. Patella long and broader than the femur, straight. Ratio of length of femur to that of patella as 24 to 17. Tibia rather long, armed near base with a stout dorsal spine, the mesal margin diagonally truncate, smooth with a short blunt tooth curved forward on the dorsal angle. In dorsal view the tibia is narrower at base and then gradually widened on the mesal side and abruptly widened laterally, the swelling so formed thickly clothed with stiff hairs directed forward, the dorsal margin obliquely truncate with the mesal angle armed with two short black incurved teeth. Paracymbium small and strongly curved. Tegulum deeply excavated on the mesal side for the reception of the tail-piece of the embolic division, the bezel very high and extended forward as a quadrate membraneous plate. The embolic division of the spiral type, the tail-piece thin and coiled with two turns, the embolus whip-lash in form and making a complete turn around the tip of the bulb.

Holotype male, in the Cornell University Collection.

UTAH: St. Johns, Oct. 8, 1927. 4 ♂ (R. V. Chamberlin).

Cochlembolus sacer n. sp.

♂. Length, 1.7 mm. Cephalothorax dusky yellow orange with darker radiating lines; viewed from above rounded on the sides posteriorly, the sides nearly straight and converging towards the front, clypeus protuding, rounded; viewed from the side, ascending evenly to the top of the cephalic lobe which is rounded on top and in front and separated from the ocular area by a transverse groove. Ocular area and clypeus slanting strongly forward in a straight line. Clypeus strongly convex. Cephalic lobe clothed in front with numerous stiff hairs directed forward and downward. Median ocular area clothed with shorter hairs. Cephalic pit small.

Posterior eyes in a slightly recurved line, equidistant, separated by the diameter. Anterior eyes in a slightly procurved line, the median smaller than the lateral, almost touching and separated from the lateral by more than the diameter. Chelicerae orange yellow. Sternum gray over orange yellow, darker along the edge. Endites the same color but without the gray. Legs and palpi orange yellow. Abdomen gray.

Femur of palpus nearly straight. Patella broader distally and gently curved downward. Ratio of length of femur to that of patella as 19 to 13. Tibia in dorsal view gradually widened distally with a sharp tooth on the mesal half which is separated by a deep rounded notch from the broader rounded lateral part. Tibia armed dorsally with a row of four stiff hairs. Tibia in mesal view shows the tooth at mesal angle short black and strongly incurved, and on the dorsal side near the margin in line with the row of hairs there is a high rounded hump. Bezel high and narrow. Embolic division very much as in *alpinus* but the embolus is much longer and very slender.

Holotype male, in the Cornell University Collection.

ALBERTA: Lake Louise, Aug. 4, 1927, 1 ♂.

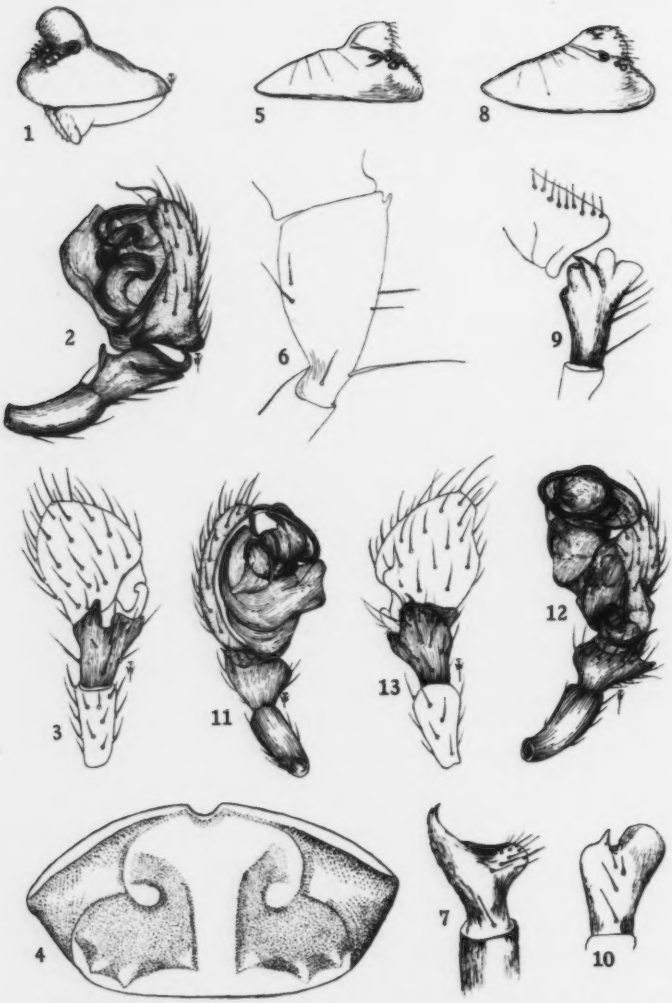
Emerton (Conn. Acad. Sci. Trans. 20:150, pl. 2, fig. 7. 1915) figured this species under the name of *alpinus* Bks. His specimen was from Sulphur Mt., Banff, Alberta, and was taken in moss below the Alpine Club House.

COCHLEMBOLUS VERNALIS Emerton.

Lophocarenum vernale Emerton. Conn. Acad. Sci. Trans. 6:51, pl. 14, fig. 8. 1882.

Diplocephalus vernalis Banks. U. S. Nat. Mus. Bul. 72:27. 1910.

The type specimens in the Museum of Comparative Zoology have apparently been dry and are very dirty. The colors are unreliable. The following notes were taken some years ago when the drawings of the palpus were made.



COCHLEMBOLUS ALPINUS, 1-4; C. SANCTUS, 5-7; C. SACER, 8-10; C. VERNALIS, 11-13.—CROSBY.

♂. Length, 1.5 mm. (according to Emerton). Cephalothorax viewed from the side ascending in a nearly straight line to the top of the cephalic lobe which is very low, rounded over the front of the lobe and then slopes downward at a steep angle through the median ocular area and clypeus.

Posterior eyes in a slightly recurved line. Anterior eyes in a slightly recurved line, the median almost touching but well separated from the lateral. Sternum broad, rounded on the sides with the hind coxae separated by less than the length.

Patella of palpus longer than tibia without the apophysis. Tibia armed dorsally with a broad rounded projection bearing a small tooth at apex. Near the base of this projection on the lateral side an erect process slanting forward. On the back of the tarsus opposite the paracymbium there are two parallel ridges. The paracymbium rather stout and bent in a semicircle. The body of the embolic division is very similar to *C. alpinus*. The tail-piece appears as a semilunate plate with a short projection on the lower inner corner. This plate is the first element of a spiral which at first appears double owing to the fact that the edges of the band are more strongly chitinized. On the third turn these edges come together to form the whip-lash-like embolus which is coiled twice around the end of the bulb with the tip lying near the bezel.

♀. Length, 1.8 mm. Posterior eyes in a slightly recurved row, the median separated by about the diameter and nearer to the lateral than to each other. Owing to the bad condition of the specimen the other characters could not be made out.

Type locality. Pine Rock, New Haven, CONNECTICUT (March).

EXPLANATION OF PLATE IV.

1. *C. alpinus,* cephalothorax, lateral view.
2. *C. alpinus,* right palpus, mesal view.
3. *C. alpinus,* right palpus, dorsal view.
4. *C. alpinus,* epigynum.
5. *C. sanctus,* cephalothorax, lateral view.
6. *C. sanctus,* right tibia of male palpus, mesal view.
7. *C. sanctus,* right tibia of male palpus, dorsal view.
8. *C. sacer,* cephalothorax, lateral view.
9. *C. sacer,* right tibia of male palpus, mesal view.
10. *C. sacer,* right tibia of male palpus, dorsal view.
11. *C. vernalis,* left palpus, meso-ventral view.
12. *C. vernalis,* left palpus, lateral view.
13. *C. vernalis,* left palpus, dorsal view.

The drawings were made by Nellie H. Crosby and Albert W. Force.

Notes on Pennsylvania Ortalidae (Dipt.).

By S. W. Frost, Pennsylvania State College.[1]

The continued use of baits as traps during the season of 1928 yielded several new records which should be added to the list of Ortalidae previously noted,[2] and give some variations in catches worth mentioning. The appended list of Ortalidae taken in Pennsylvania, shows by comparison, the value of bait traps in securing records of these species.

Approximately 1,000 bait traps were operated in a peach orchard near Arendtsville, Pa., during the past season. The baits consisted chiefly of molasses or refiner's syrups diluted by twenty parts of water and placed in 1 gallon tin cans, which were hung in the trees. In some cases sodium arsenite was added to the molasses, giving a bait of longer duration. The first examination of the baits was made on May 8 and collections were made each subsequent week until November 1.

The determinations of the species were made by Mr. E. T. Cresson of the Academy of Natural Sciences, Philadelphia, Pa. Only a few of the specimens of each series were sent for identification as some of the species were too numerous and too common to deem this advisable. The addition of new records during 1928 brings the total number of species taken from bait traps to 14, which represents about one-half the number of species of this locality and no doubt nearly all the species that could be expected from baits operated under these conditions. Undoubtedly if the traps were hung in more open places or along the edges of woods, the number of species could be increased.

It will be noted in the following summary that, with one exception, the species taken during 1927 were recovered again in 1928, and in approximately the same numbers. *C. annulipes* Macq., for some reason, was not taken as often during 1928 as in the preceding year. The new records added during the current season are probably due to the greater number of traps employed.

---

[1] Published by permission of the director of the Agricultural Experiment Station, as technical paper No. 465.

[2] Frost, S. W., Ent News, 39:169-171, 1928.

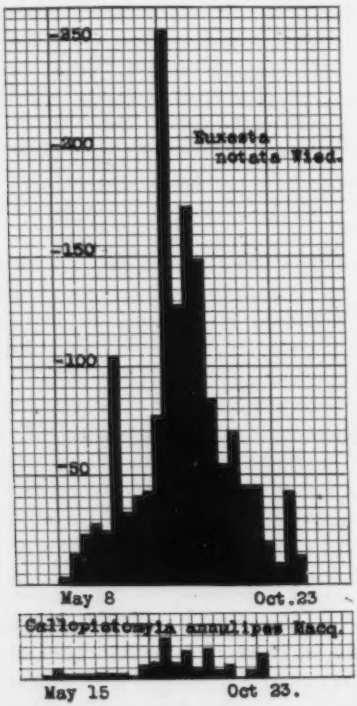
SUMMARY OF COLLECTIONS OF ORTALIDAE FROM BAIT PAILS.

Species	1927 Number specimens taken	1927 Period specimens taken	1928 Number specimens taken	1928 Period specimens taken
Rivellia viridulans R-D	5	July 3–19	2	July 24, Sept. 4
Camptoneura picta Fab.	1	June 10	1	June 26
Idana marginata Say.	5	June 15, July 5	4	June 12 —26
Tephronota ruficeps V. d. W.	2	July 12, Aug. 2	7	July 3 —31
Callopistromyia annulipes Macq.	208	Apr. 12— Oct. 18	117	May 15 —Oct. 16
Pseudotephritis corticalis Loew.	12	June 2— July 23	0	
Pseudotephritis vau Say.	76	May 10— Oct. 11	28	May 21 —Oct. 16
Pseudotephritis approximata Bnks.	0		2	Aug. 7, Sept. 4
Euxesta notata (Wied)	417	May 10— Oct. 11	1342	May 8 —Oct. 16
Seioptera vibrans Linn.	4	June 15 —28	4	June 12 —July 17
Myrmecomyia myrmecoides Lw.	2	June 28	0	
Tritoxa incurva Lw.	0		1	Sept. 13
Chaetopsis fulvifrons Macq.	0		2	Aug. 2
Chaetopsis massyla Wlk.	0		1	May 28

Some pronounced differences in the number of specimens taken during the same periods in 1927 and 1928 are worth consideration. In the cases of *E. notata* Wied., and *C. annulipes* Macq., the weekly collections during May, June and July, 1927, greatly exceeded those during August, September and October. In 1928 the conditions were reversed and the captures during August, September and October exceeded those during the early part of the season. This was especially true in the case of *C. annulipes* Macq., and the plotted curves for 1928 should be compared with those for 1927.[1] These differences can be correlated with variations in precipitation and temperature. June and July, 1928, were abnormally wet and cool, 11.04 inches of rain falling in June, and 5.26 inches in July, 1928, as against 4.48 inches and 4.83 inches in June and July, 1927. It is

[1] Frost, S. W. Op. cit.

interesting to note further that the one large collection of *E. notata* Wied., which stands out conspicuously in June, 1928, occurred during the week of June 6 to 13, when only .5 inches of rain fell, and this occurred during a single period of twenty-



four hours. The combined influence of precipitation and low temperatures tends to reduce the catches of Ortalidae. It would thus appear that peaks in the curves for captures by baits do not necessarily indicate broods. The same condition might be attained in running trap lanterns or other mechanical methods for obtaining specimens.

In all the captures the males and females were taken in approximately equal numbers. The three species coming to the traps most freely, show this best. During 1928, 636 ♂ and 706 ♀ *E. notata* Wied; 12 ♂, 16 ♀ *P. vau* Say, and 68 ♂, 49 ♀ *C. annulipes* Macq., were taken.

The genus *Rivellia* was not freely attracted to baits. Of the seven species recorded from Pennsylvania, only one, *R. viridulans* Desv., was taken in baits and this only occasionally. It would look as though this genus had habits different from the majority of the other Ortalidae. The European genus *Platystoma*, belonging to the same subfamily, responded most readily to attractive baits, according to Cuscianna.[2]

CHECK LIST OF THE PENNSYLVANIA ORTALIDAE.

Rivellia flavimana Loew. (H) (J) (C).
Rivellia pallida Loew. (H) (J).
Rivellia quadrifasciata Macq. (H) (J) (C).
Rivellia variabilis Loew. (H) (J) (C).
Rivellia viridulans Desv. (H) (J) (C) (F).
Rivellia boscii Desv. (J).
Rivellia cognata Cresson. (C).
Myrmecomyia myrmecoides Loew. (H) (F).
Tritoxa flexa Wied. (H) (J).
Tritoxa incurva Loew. (J) (F).
Camptoneura picta Fab. (H) (J) (F).
Idana marginata Say. (H) (J) (F).
Tephronota narytia Wlk. (H) (J).
Tephronota ruficeps V. d. W. (H) (C) (F).
Melieria philadelphica Desv. (J).
Tetanops luridipennis Loew. (H) (J) (C).
Callopistromyia annulipes Macq. (H) (J) (F).
Pseudotephritis corticalis Loew. (H) (J) (F).
Pseudotephritis approximata Banks. (F).
Pseudotephritis vau Say. (H) (J) (F).
Chrysomyza demandata Fab. (H) (J).
Euxesta notata Wied. (H) (J) (F).
Chaetopsis aenea Wied. (H) (J).
Chaetopsis massyla Wlk. (F).
Chaetopsis fulvifrons Macq. (H) (F).
Seioptera vibrans Linn. (H) (J) (C) (F).
Scioptera colon Loew. (H).
Seioptera albipes Cresson. (C).
Stenomyia tenuis Loew. (H) (J).
Eumetopia rufipes Macq. (J).
Odontomera ferruginea Macq. (C).
Sepsisoma flavescens Johnson. (C).

H=State collection, Harrisburg.
J=Unpublished list of Penn. Diptera by Johnson.
F=New records by Frost.
C=Published records by Cresson.

[2] Cuscianna, N. 1922. Boll. Lab. Zool. gen. e. agrar. R. Scuola sup. d'Agric. Portici. Vol. 15:226-253.

A Calendar of Kansas Butterflies.

By VANCE RANDOLPH, Pittsburg, Kansas.

For some years I have been more or less interested in the life history and habits of *Dione vanillae*,[1] but it was not until I attempted a study of the seasonal migrations of this species that the difficulties of such investigations were brought home to me. *Dione vanillae* appears in southern Kansas about August 1 and flies until late November, but neither egg, larva, chrysalis or adult seems able to survive the Kansas winter.[2] In Mexico, however, *vanillae* is said to breed the year 'round, as it does in California.[3] It would certainly be interesting to know the precise dates upon which *vanillae* first appears at a series of points between southern Kansas and the northernmost region in which it flies continuously, but this information is not available at present. There are plenty of enthusiastic butterfly-hunters in the sparsely settled South and West, but most of them are more interested in collecting showy specimens than in recording definite information about dates of appearance and the like.

With this condition in mind, I have gone through my notes made at Pittsburg, in southeastern Kansas, for the last twelve years, and have set down such information as I have about the dates of the common butterflies in this locality. Since this work requires no technical knowledge beyond the mere ability to recognize common species, it seems to me that many other amateur lepidopterologists in the southern *hinterland* might be induced to record similar data, and that these records should be carefully preserved for the use of future investigators of seasonal and geographical distribution.

ANCYLOXIPHA NUMITOR is never common here. I have taken less than a dozen specimens, all flitting about marsh grasses and cat-tails, between August 1 and September 15.

[1] Randolph, Vance. Life History and Habits of Dione vanillae, Trans. Kansas Acad. Sci., XXX:351-362, 1919-1921.

[2] Randolph, Vance. On the seasonal migrations of Dione vanillae in Kansas, Ann. of the Ent. Soc. Amer., XX (2):242-245, 1927.

[3] Wright, William Greenwood. West coast butterflies, San Bernardino, 1905.

ANOSIA PLEXIPPUS appears early in April and flies until about June 15. Very few specimens are seen between July 1 and the middle of August, but great numbers suddenly appear about August 25, and the butterfly is common until late October. I have taken a few as late as November 20.

ARGYNNIS CYBELE is first seen in early May, and is fairly common until the end of June. Very rare from early July to the middle of September, when it becomes common again, and persists well into October.

ARGYNNIS IDALIA appears early in July and flies until late September. It is usually rather rare, but in 1919 I saw hundreds of specimens hovering about the red iron-weeds, in late July and the first half of August.

ATALOPEDES HURON is common from June 1 to the middle of November, being most abundant in September and October.

BASILARCHIA ASTYANAX is never very common here, but I have taken specimens from early May to late October. It is most abundant, I think, in late August and early September. I have taken several of the larvae on the wild cherry trees, in July.

BASILARCHIA DISIPPUS is comparatively rare in this locality. The earliest appearance recorded in my notes is June 11, and the latest entry September 27. Practically all of my specimens have been taken near willow trees on the margin of a small lake.

CATOPSILIA EUBULE appears late in July, and by the middle of September is probably the commonest of our large and showy butterflies. Not many specimens are seen after October 15, but I have taken two or three in late November, and one specimen on December 2.

CHLORIPPE CELTIS usually appears about the middle of July, and flocks about the hackberry trees all through August. Not often seen after September 20, but occasionally persists into October.

CHLORIPPE CLYTON is comparatively rare, but I have taken a few specimens in July and August, and one as late as the middle of September.

COLIAS EURYTHEME appears about the middle of April, and is very common from July 1 to the middle of November. I took several specimens on Dec. 3 in 1927.

COLIAS PHILODICE first appears early in March, and is common everywhere until the latter part of November.

DEBIS CREOLA is rare. I have seen only three specimens, and these were all taken in the first week of August, 1928.

DIONE VANILLAE appears about August 1, and is most abun-

dant from August 15 to September 15. I have never seen one later than November 28.

EPARGYREUS TITYRUS is fairly common from the middle of April to the latter part of August, and occasional specimens are taken all through September.

EUPTOIETA CLAUDIA appears about August 1, and flies until almost the end of November, being most abundant in October.

FENISECA TARQUINIUS is rare. The few specimens I have seen were all taken in September.

GRAPTA COMMA is not common, but is seen occasionally from May 1 to early September.

GRAPTA INTERROGATIONIS flies from early May to late November, and is very common from July to October.

HESPERIA MONTIVAGO appears about July 15, is very common in September and October, and persists well into November.

JUNONIA COENIA is not seen until late August or early September, and is very common in late September and all through October. Not infrequently taken as late as November 15.

LIBYTHEA BACHMANNI appears in June, and becomes quite common in the latter part of July. I have never seen one later than the middle of October.

LYCAENA PSEUDARGIOLUS is sometimes seen as early as March 10, and is very common from about April 15 to the latter part of September.

MEGANOSTOMA CAESONIA is not one of our most common species, but a few specimens may be found almost any day between early June and late October. Most abundant between September 15 and October 20. A few entries in my notes record this butterfly in late March, and I took one specimen on January 15, 1928, at Pineville, Mo.—only about seventy miles south of Pittsburg.

MELITAE PHAETON is rare. The last one I have any record of was taken September 8, 1917.

NATHALIS IOLE is first seen in late August or early September, and is most in evidence about the middle of October. I have seen very few specimens later than November 15.

NEONYMPHA EURYTUS appears early in May, and is common throughout June and July, but is seen only in early morning and late afternoon, flitting about low weeds and grasses.

PAPILIO AJAX appears as early as May 1, and is most abundant about the middle of July. It is much less common in August, and is seldom seen after the middle of September.

PAPILIO ASTERIAS is rare. I once took a pair in coitus on July 17, and found a full-grown caterpillar July 29. I have never seen this butterfly later than August 25.

PAPILIO CRESPHONTES is never common. It appears in the first half of August and is most abundant in the first half of October.

PAPILIO PHILENOR occurs from early June to late October, and is most common in August.

PAPILIO TROILUS is first seen in the latter part of April, and becomes very common in July and early August. From then on it is rare, although I have taken a few specimens as late as October 10.

PAPILIO TURNUS is never very common, but a few specimens are seen every year in late April and early May, and persist well into September.

PHYCIODES NYCTEIS appears about the middle of June, becomes fairly common in August, and persists in small numbers to the latter part of November.

PHYCIODES THAROS is common from early April to late September; it is subject to considerable variation, and some of its phases are liable to confusion with *P. nycteis*.

PIERIS PROTODICE usually appears about the middle of May, and flies until the latter part of October.

PIERIS RAPAE is sometimes seen as early as March 15, and is fairly common until about the middle of October.

PYRAMEIS ATALANTA appears in April, and flies until about the middle of September. Occasional specimens are taken as late as October 30.

PYRAMEIS CARDUI, according to my notes, does not appear until about the first week in July, and is not seen after the middle of November.

PYRAMEIS HUNTERA flies from early April to late August.

PYRRHANAEA ANDRIA appears early in March, becomes very abundant in August, and persists until late November.

SATYRUS ALOPE is seldom seen before July 1, but becomes very common from the middle of July to the end of August, and often persists into the first part of a mild October.

TERIAS LISA appears about August 1, and from then on is one of our commonest roadside butterflies until late October. In the mild winter of 1927 I saw several specimens in the first week of December.

TERIAS MEXICANA is very rare, and I have not taken more than a dozen in all my years of collecting. I saw two specimens on November 29, 1927.

TERIAS NICIPPE appears about August 1, and becomes fairly common in late August and early September. I have taken a few specimens in October.

THANOAS MARTIALIS, according to my notes, occurs from late April to November.

THECLA MELINUS is not very common at any time, but I have taken it at various times between August 1 and October 28.

VANESSA ANTIOPA appears about the middle of March in ordinary seasons, and a few specimens are seen in early April. I have never taken *antiopa* during the summer months, but it appears again in late October and early November.

Entomology in the Literary Supplements.

Scientists, we hope, are gratified with the interest the general public is taking in their technical problems. One of the greatest indications of this interest is the change in reading taste on the part of the American people from fiction to non-fiction works. This was no doubt influenced by the publication of numerous interesting bits of popular science such as Slosson's 'Creative Chemistry' or DeKruif's recent 'Hunger Fighters.' Along with numerous newspaper articles and press notices these come as welcome preludes of an era when science will have a great influence in guiding social problems toward a solution. Today the public at least knows that the doctor is not the only scientist who can come to his aid.

The attention certain scientific books have recently been given in our leading literary sheets is probably less familiar to us than the many newspaper accounts or book store displays. The great mass of technical books never receive the stamp of literary critics, having no merits in this direction, but within the past ten years a galaxy of technical problems of science have been written into the language of the citizen who formerly read only current novels and newspapers. Some of these have been recognized by critics because of the style of writing and the unusual methods of presenting the subject matter.

The principal literary sheets have on their staffs one or more reviewers who have more than a bowing acquaintance with science. Many of us will be familiar with the names of Howard Madison Parshley, William Beebe, or Logan Clendening. These names, along with numerous others will be seen accompanying reviews in the 'New York Herald-Tribune Books,' the most widely circulated literary supplement in America.

Within the past year the writer has noticed careful reviews of a number of books on entomology in the above mentioned publication. It is interesting to note that, though the literary merit is perhaps the prime consideration, the subject matter is given careful analysis. Carpenter's 'The Biology of Insects,' though probably used largely as a text or reference, received more than a column of appreciative comment. Balfour-Browne's recent 'Insects,' a number in Holt's 'Home University Library,' received a short but friendly note. Wheeler's 'Foibles of Insects and Men,' a series of reprints of addresses and popular

studies, received considerable praise for its humanitarian viewpoint and literary merit. His latest study, 'The Social Insects,' first published in France and recently made available in English, was carefully reviewed by William Beebe, who has first hand knowledge of the social insects. This review occupied more than a column and a half, calling attention to the behavior and evolution of the social insects as well as the keen human analogies and scholarly presentation. The most recent review is that of Phillips' 'Beekeeping.' Ben Ray Redman, who writes 'Old Wine in New Bottles,' a section of 'Books' devoted entirely to reprint editions, gives half a column to this work, ordinarily considered a textbook or manual of apiculture. "Although the book is addressed only to beekeepers, potential and active, few readers possessed of any curiosity will find it dull. For my part I found it fascinating . . . ." This from a reviewer who admits no knowledge of beekeeping before reading the book!

Within the past five years entomologists have seen a great improvement in the technical content of the books on insects, and now the literary merit is likewise improving. Dr. Howard tells us "The world is getting better, especially the entomologists."

PAUL KNIGHT, University of Maryland.

Entomological Literature

COMPILED, WITH THE ASSISTANCE OF "BIOLOGICAL ABSTRACTS," UNDER THE SUPERVISION OF E. T. CRESSON, JR.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

The numbers **within brackets** [ ] refer to the journals, as numbered in the list of Periodicals and Serials published in the January and June numbers (or which may be secured from the publisher of Entomological News for 10c), in which the paper appeared. The number of, or annual **volume**, and in some cases the part, heft, &c. the latter **within** ( ) follows; then the pagination follows the **colon** :

All continued papers, with few exceptions, are recorded only at their first installments.

*Papers containing new forms or names have an * preceding the author's name.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

☞ *Note the change in the method of citing the bibliographical references, as explained above.*

Papers published in the Entomological News are not listed.

GENERAL.—Dyar, H. G.—Obituary. [68] 69: 151-152. **Hollas, F.**—Photographische aufnahmen lebender insekten. [26] 8: 75-76, cont. **Ritchie, J. D.**—Capture of dragonflies by larvae of Cicindelidae. [19] 23: 271. **Schwarz, E. A.**—Obituary. [10] 30: 153, ill. **Swaine, J. M.**—Forest en-

tomology and its development in Canada. [Canada Dept. Agric.] Pamph. 97: 3-20. **Taylor, R. L.**—The arthropod fauna of coniferous leaders weeviled by Pissodes strobi. [5] 35: 217-225. **Zweigelt, F.**—Klima und entwicklung. [26] 8: 93-94, ill., cont.

ANATOMY, PHYSIOLOGY, ETC.—Abbott, C. E.—The tarsal chemical sense of the screw worm fly, Cochliomyia macellaria. [5] 35: 201-204, ill. **Chorine & Korvine-Kroukovsky.**—Sur l'immunisation de fragments isolés du corps des chenilles de Galleria mellonella. [77] 100: 15-16. **Crampton, G. C.**—The evolution of the head region in lower arthropods and its bearing upon the origin and relationships of the arthropodan groups. [4] 60: 284-301, ill. **Ferris, G. F.**—The wax-secreting organs of the Coccidae. [55] 5: 67-70. **Murdock, G. E.**—The wax-secreting mechanism in the adult female of Icerya purchasi. [55] 5: 71-75, ill. **Portier & Rorthays.**—Sur l'evolution pondérale des chrysalides des Lépidoptères. [77] 99: 1954-1956.

ARACHNIDA AND MYRIOPODA.—*Chamberlin, R. V.—Three new lithobiomorphous chilopods from Washington and Oregon. [55] 5: 85-86. A two-eyed spider from Utah. [5] 35: 235-236. ***Ewing, H. E.**—Three new american chiggers (Acarina: Trombidiidae). [10] 31. 9-11. ***Jacot, A. P.**—New oribatoid mites. [5] 35: 213-215. ***Kendall, J.**—A new gall mite on Prunus maritima. [5] 35: 210-212, ill. **Marcus, E.**—Spinnentiere oder Arachnoidea. IV: Bärtierchen (Tardigrada). [Tierwelt Deutschlands] 12: 1-232, ill. ***Petrunkevitch, A.**—The spiders of Porto Rico. Part 1. [Trans. Conn. Acad. Arts and Sci.] 30: 7-158, ill. **Williams & Hefner.**—The millipedes and centipedes of Ohio. [Ohio State Univ. Bull.] 33: 93-147, ill.

THE SMALLER ORDERS OF INSECTS.—Fendt, F. Die Libelle. [Kosmos] 26: 22-25, ill. ***Morgan, A. C.**—A new genus and five new species of Thysanoptera foreign to the United States. (S). [10] 31: 1-9. ***Moulton, D.**—A new ankothrips from Colorado. [55] 5: 91-92. **Richter, W.**—Die Thysanopteren des arktischen gebietes. [Fauna Arctica, Jena] 5: 837-850. **Schuster von Forstner, W.**—Was veranlasst die Libellenzüge. [26] 8: 29. **Snyder, T. E.**—Termites and architecture. [76] 1929: 143-151, ill. **Stitz & Ramme.**—(See under Orthoptera.)

ORTHOPTERA.—*Caudell, A. N.—A new variety of Inscudderia walkeri from Virginia (Tettigoniidae). [10] 31: 11-13. **Engelhardt, G. P.**—An unusual flight record of the oriental mantid Paratenodera sinensis—from New York

City. [19] 23: 249. ***Hebard, M.**—Studies in the Gryllidae of Panama. [1] 54: 233-294, ill. **Stitz & Ramme.**—Nachtrag zu dem Neuropteren-und dem Orthopteren-abschnitt. [Fauna Arctica, Jena] 5: 855-856. **Uvarov, B. P.**—Synonymy of mantis (Thespis) armata, (Mantidae). (S). [75] 3: 74-75.

HEMIPTERA—*Barber, H. G.—Two new Lygaeidae from the western United States. (Lygaeidae). [19] 23: 264-268. ***China & Myers.**—A reconsideration of the classification of the cimicoid families, with the descriptions of two new spider-web bugs. (S). [75] 3: 97-125, ill. **Cockerell, T. D. A.**—Drosicha burmeisteri apparently rediscovered (Coccidae). [10] 31: 16. ***da Costa Lima, A.**—Contribeicão ao estudo dos aleytodideos da subfamilia Aleurodicinae. (S). [Suppl. Mem. Inst. Oswaldo Cruz] 1928: 128-140, ill. **Essig, E. O.**—Some insects of the Yosemite National Park. Coccidae. [55] 5: 76-78. **Knight, H. H.**—New species of Halticotoma and Sixeonotus (Miridae). [19] 23: 241-249. ***Knowlton, G. F.**—Notes on a few species of Macrosiphini (Aphididae) from Utah with descriptions of two new species. [55] 5: 79-84, ill. **Muir, F.**—New and little-known South American Delphacidae (Fulgoroidea) in the collection of the British Museum. [75] 3: 75-85, ill. **Sprehn, C.**—Die Pentastomiden des arktischen gebietes. [Fauna Arctica, Jena] 5: 853-854. ***Waterston, J.**—A new encyrtid (Chalcid.) bred from Clastoptera. (Cercop.). (S). [22] 19: 249-251, ill.

LEPIDOPTERA.—Bargmann, R.—Anaea rosae forma flora subsp. nova. (S). [80] 2: 196. Hyposcada evanides f. neustetteri m. n. (S). [80] 2: 212. Neue exotische falter. (S). [80] 2: 223-224. Cont. ***Box, H. E.**—La "Lagarta rosada" del algodonero (Pectinophora gossypiella). Una plaga que no queremos tener en Tuchumán. (S). [Rev. Ind. Agric. Tucumán] 19: 106-110, ill. ***Busck, A.**—A new injurious pine moth (Gelechiidae). [10] 31: 13-15, ill. **Clark, A. H.**—Notes on some butterflies from New England. [5] 35: 226-228. ***d'Almeida, R. F.**—Contribution a l'etude des Rhopalocères américains. (S). [24] 97: 369-388. ***Dyar, H. G.**—A new beneficial moth from Panama and a scavenger (Pyralidae, Phycitinae). [10] 31: 16-17. ***Gunder, J. D.**—New Euphydryas (Rhopalocera). [55] 5: 49-50, ill. **H. A. M.**—Apuntes lepidopterológicos. (S). [Bol. Soc. Columbiana Cien. Nat] 17: 180-183. ***Heinrich, C.**—Two new american Coleophoridae. [10] 31: 18-19. **Hepp, A.**—Zum überwinterungsstadium von Stilpnotia (Leucoma) salicis (Lymantriidae). [80] 2: 67-68. **Holland, W. J.**—The argynnids of the Nokomis-group. [3] 19: 15-

34, ill. ***Kaye & Lamont**—A catalogue of the Trinidad Lepidoptera Heterocera. [Mem. Dept. Agric. Trinidad and Tobago] 3: 1-159, ill. ***Lathy, P. I.**—The female of Catagramma casta. (S). [75] 3: 143. **Lei, H. K.**—Silkworm diseases in South China. [China Jour.] 10: 30-37. **Lindsey, A. W.**—Hesperioidea from the Kartabo district of British Guiana. [Jour. Sci. Lab. Denison Univ.] 23: 231-235, ill. **Pollard, C. L.**—Stilpnotia salicis, a European moth in the United States. [19] 23: 250. **Portier & Rorthays.**—Interprétation de la constance de poids que présentent certaines chrysalides pendant une longue période de leur existence. [77] 99: 1956-1958, ill. ***Rummel, C.**—Butterfly aberrations. [19] 23: 268. **Voukassovitch, P.**—Observations biologiques sur un Lépidoptère (Ephestia kuehniella). [77] 100: 62-64. **Wolcott, G. N.**—The mystery of Alabama argillacea. [90] 63: 82-87.

DIPTERA.—Curran, C. H.—Mosquitoes and other flies. [15] 29: 45-49, ill. ***Johnson, C. W.**—A new cecidomyiid of the genus Lestodiplosis. [5] 35: 216. **Karl, O.**—Zweiflügler oder Diptera. III: Muscidae. [Tierwelt Deutschlands] 13: 1-236, ill. **Munro, H. K.**—A note on the systematic status of Tridacus lounsburyi. (Trypetidae). [An. Med. Transvaal Mus.] 12: 336-337. ***Parent, O.**—Etude sur les Diptères Dolichopodides exotiques conservés au Zoologisches Staats institut und Zoologisches Museum de Hambourg. [Mitt. Zool. Staat. und Zool. Mus Hamburg] 43: 155-198, ill. **Spencer, G. J.**—(See under Coleoptera). ***Van Duzee, M. C.**—New north american species of Dolichopodidae. [55] 5: 87-89.

COLEOPTERA.—***Bernhauer, M.**—Beitrag zur südamerikanischen Staphylinidenfauna. [Tijd. Ent.] 71: 286-288. ***Brown, W. J.**—Studies in the Scarabaeidae. (I). [4] 60: 301-307, cont. **Bryson, H. R.**—A method for rearing wireworms (Elateridae). [Jour. Kansas Ent. Soc.] 2: 15-21. ***Chamberlin, W. J.**—Remarks on the Buprestidae of the North Pacific Coast Region with descriptions of new species. [55] 5: 93-95, cont. ***Davis, A. C.**—A new Cicindela (Cicindelidae). [55] 5: 65-66. **Douglass, J. R.**—Chrysomelidae of Kansas (1). [Jour. Kansas Ent. Soc.] 2: 2-15, cont. **Essig, E. O.**—Diabrotica balteata. [55] 5: 66. ***Fall, H. C.**—Miscellaneous notes and descriptions. [19] 23: 236-240. ***Fisher, W. S.**—A revision of the North American species of buprestid beetles belonging to the genus Agrilus. [Bull. U. S. N. M.] 145: 1-347, ill. **Fleutiaux, E.**—Note sur le genre Agrypnella et description d'un genre nouveau. (S). [25] 1928: 282-287. ***Gebien, H.**—Ueber einige gruppen amerikanischer Tenebrioniden (Col.) (S). [60]

89: 167-234, ill. ***Gellermann, H.**—A new species of Hydroporus from Washington. [55] 5: 63-65, ill. ***Hatch, M. H.**—Further studies on Phaedon (Chrysomelinae). [55] 5: 59-62. Studies on Dytiscidae. [19] 23: 217-229. **Hoscheck & Théry.**—Monographie der gattung Hyperantha (Buprestidae). [Mitt. Zool. Staat. und Zool. Mus. Hamburg] 43: 125-154, ill. **Jeannel, R.**—(See under Special Notice). **Konschegg, V.**—Kritik über die präparation der Coleopteren. [26] 8: 91-92. **Latta, R.**—The effect of the extreme temperature of Dec. 7, 8, and 9, 1927 on hibernating Crioceris asparagi and Hippodamia convergens at Ames, Iowa. [5] 35: 229-231. **Salt, G.**—A Study of Colaspis hypochlora. (S). [22] 19: 295-308, ill. **Spencer, G. J.**—Dead Pollenia rudis as hosts of dermestids. [4] 60: 283. ***Van Dyke, E. C.**—New species of heteromerous Coleoptera. [19] 23: 251-262. The species of the genus Lepyrus (Curculionidae) in North America. [55] 5: 53-58.

HYMENOPTERA.—*Bequaert, J.—Microtrimeria cockerelli, a new genus and species of South America masarids. [5] 35: 191-198, ill. **Brues, C. T.**—A note on the genus Pelecinus. [5] 35: 205-209. ***Cockerell, T. D. A.**—Some bees from Utah. [5] 35: 232-234. ***Compere, H.**—Description of a new species of Coccophagus recently introduced into California. [67] 5: 1-3, ill. **da Costa Lima, A.**—Hadronotus brasiliensis, novo scelionideo parasito de ovos de um coreideo. [Suppl. Mem. Inst. Oswaldo Cruz] 1928: 1-2, ill. **Duncan, C. D.**—Plant hairs as building material for Polistes. (Vespidae.) [55] 5: 90. **Engelhardt, G. P.**—An observation on the breeding habits of Chlorion harrisi in Texas. [19] 23: 269-271. ***Gahan, A. B.**—Description of an egg-parasite of Exopthalmus quadrivittatus. (S). [10] 31: 17-18. **Hicks, C. H.**—Notes on Anthidium palliventre. [55] 5: 51-52. **Parks, H. B.**—Nesting habits of the bee, Nomis nortonii in Texas. [19] 23: 263. **Rau, P.**—Autumn and spring in the life of the queen Polistes annularis and P. pallipes. [19] 23: 230-235. **Strelnikov, T. D.**—Mermis parasitism in Pachycondyla striata. [5] 35: 199-200, ill.

SPECIAL NOTICES. — Die Tierwelt mitteleuropas. — Hrsg. Brohmer, Ehrmann & Ulmer. Bd. 3, Lf. 4: about 98 pp., ill. Spinnentiere. This work would probably be of interest to American students of Arachnida. **Monographie des Trechinae.** — Morphologie comparée et distribution géographique d'un groupe de Coléoptéres. Les Trechini cavernicoles by R. Jeannel. [L'Abeille, 35: 1-808, ill.]. This is a monographic contribution and will prove valuable to all students of this group of Coleoptera.

Doings of Societies.

At the October and November, 1928, meetings of the Chicago Entomological Society the following items of interest were reported:

LEPIDOPTERA: Mr. W. F. Henderson reported the capture on Sept. 9th at Palos Park, just outside the limits of the city of Chicago, of *Danaus berenice* form *strigosa*. This is extremely unusual and much further north than it has hitherto been reported. The specimen was a female.

Mr. Emil Beer reported finding a number of caterpillars feeding on the flowers and seed pods of *Pentstemon glabra*. These developed late in September into *Oncocnemis saundersiana*, only one specimen of which has heretofore been reported taken here.

Mr. Arthur Herz reported rearing *Polia ectypa* on *Silene stellata*, commonly known as starry campion. He picked a number of the blossoms late in July or early in August when the seed capsules begin to form, kept them in water standing over a sheet of white paper and when he found frass on the paper he sought and found the larvae which he succeeded in bringing to maturity. After the last moult the larvae also feed on the leaves. They pupate in the ground in a case lightly bound together by a secretion of the larva. Only one moth emerged the same year, on September 5. The remainder hibernated, the first specimen emerging June 23 and the others developing from time to time until July 25. This species has always been considered very rare.

Messrs. Beer, Herz, Dluhy, Lustig and Wyatt attended the field meeting held on April 22 in the Dune region at Tremont, Indiana. The weather was cold and nothing was flying. Little of interest was found until afternoon when a moth was beaten out of a witch hazel whose leaves had adhered over winter. Diligent beating of witch hazel and oak resulted in the capture of twelve or thirteen specimens, all *Conistra ceromatica*, except one *Graptolitha bethunei*. Later, on Decoration Day, May 30, at the same place the same collectors found larvae on witch hazel in some numbers, but only Wyatt succeeded in rearing four to maturity. These proved to be *Conistra graefiana* and developed September 22 to 30. On October 21 Messrs. Beer and Wyatt made another trip to the same place and captured by beating and sugaring a number of specimens of *graefiana* and also a few *ceromatica*, besides one of *Graptolitha bethunei* and several *Iodia rufago*.

Other interesting captures during the year were *Graptolitha viridipallens* on sugar at Edgebrook, *Prodenia eridania* on sugar at Tremont, *Erebus odora* on sugar at Edgebrook and *Agriopodes lepidula* on sugar at Elmwood Park.

Mr. Herz bred quite a number of the latter species from eggs deposited by a captured specimen, feeding them on dandelion and dock. Six specimens developed during the fall and the remaining pupae hibernated.

Messrs. Wyatt and Beer bred to maturity six specimens of *Papaipema cerina* from larvae which they found in grass in the early stages. The small larvae were later transferred to stems of mandrake and finally into turk's cap lily in which they matured. They also bred *Papaipema harrisi, cataphracta, speciosissima, marginidens, impecuniosa* and *silphii*. Mr. Herz also bred several of these species and among others an unusual form resembling *marginidens,* but without the ordinary white spots. This was from a larva in burdock.

Mr. Charles Krueger exhibited at the meeting a large number of interesting moths and butterflies taken during a trip to Florida.

ALEX K. WYATT, Secretary.

OBITUARY

Prof. EDWIN EDDY CALDER, A. M., Ph. C., Phar. D., Dean of the Rhode Island College of Pharmacy and Allied Sciences and an authority in chemical circles, died at the Deaconess Hospital, at Boston, at 2 o'clock, January 16, 1929, after an illness of several months. He suffered an infection of his foot last August from which blood poison developed and he was taken to the Deaconess Hospital early in September for treatment. It was found necessary to amputate a portion of the foot, but this failed to check the gangrenous development and subsequent amputations were necessary.

He was born in Providence, Rhode Island, March 17, 1853, the son of John Lewis and Julia F. (Eddy) Calder. He was educated in the public schools of this city and specialized in the sciences with particular reference to chemistry. He was assistant instructor in analytical chemistry at Brown University from 1874 until 1882 when he became professor of chemistry

at the Boston University School of Medicine where he continued until 1906.

In 1890 he also took up duties at Brown University as instructor in chemistry, conducting classes at both institutions until 1900 when he resigned his chair at Brown. He was actively associated with the Rhode Island College of Pharmacy at the same time. He received the honorary degree of A. M. from Brown University and later the honorary degrees of Ph. C. and Phar. D. from the Rhode Island College of Pharmacy and Allied Sciences.

In addition to his educational duties he conducted a private analytical chemistry business as a member of the firm of Calder & Strickland in this city, his firm having been commissioned by the State authorities to conduct investigations in connection with a number of capital crimes and important surveys.

On Dec. 23, 1875, Professor Calder married Ella A. T. Elsbree, daughter of Mr. and Mrs. Hiram Elsbree, who died several years ago. He is survived by one daughter.

Professor Calder's hobby was the study and collecting of beetles and he was the possessor of one of the largest and most complete collections of coleoptera in this section of the country. —(*The Providence Journal* for Jan. 16, 1929.)

Three brief papers on Coleoptera by Prof. Calder are listed in Leng's Catalogue of the Coleoptera and the Supplement thereto. They are:

Cicindela rhodensis n. m. Jl. N. Y. Ent. Soc. XXIV, p. 94, 1916.

New Cicindelas of the fulgida group. Can. Ent. liv, p. 62, 1922. [Describes forms from British Columbia, Manitoba and Nebraska.]

Change of name in Cicindela. Can. Ent. liv, p. 191, 1922.

Dr. HARRISON GRAY DYAR, widely known for his work on Lepidoptera, especially their larvae, on Culicidae and related Diptera, died in Washington, D. C., on January 21, 1929. An obituary notice by Dr. L. O. Howard has been published in *Science* for February 8, 1929.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Mycetophilidae—Will exchange or identify material in this family. C. F. Adams, Indiana State Board of Health, Indianapolis, Indiana, U. S. A.

Wanted—"Check List of the Lepidoptera of Boreal America" by Wm. Barnes and J. McDunnough. Kindly quote price. E. J. Dornfeld, 144 North Ave., Milwaukee, Wis.

Wanted—Moths of any species of the genus **Apantesis:** also eggs or larvae. Will determine specimens. Want to hear from anyone who will collect in this genus. Dr. E. T. Learned, Fall River, Mass.

Wanted—Names and addresses of collectors in foreign countries, also some second-hand insect cases. Write Mrs. Robert Milde, Lewiston, Minn.

Catopini—Catops (Choleva), Prionochaeta, Ptomaphagus. Wanted to borrow all possible specimens of these genera from North America for a revisional study. Correspondence solicited. Melville H. Hatch, Dept. of Zoology, Univ. of Wash., Seattle, Wash.

Chrysomelidae—Cryptocephalinae and Halticinae—will exchange insects of other orders for above named leaf-beetles. Also many duplicates in other groups of coleoptera.—Paul N. Musgrave, 514 Mt. Vernon Ave., Fairmont, W. Va.

Argynnis of the world wanted by exchange for local Lepidoptera, or by purchase. S. P. Hayes, Jr., Amherst College, Amherst, Mass.

Wanted for cash, Catocala eggs: cara, vidua, obscura, residua, ultronia, retecta, praeclara, amatrix, unijuga, pura, insolabilis, lacrymosa, judith.—E. W. K. Schwarz, 40 W. 84th St., New York City.

Wanted—Lepidoptera, especially Lycaenidae and Hesperiidae, from all localities, in exchange for local Lepidoptera. Harold I. O'Byrne, 501 Pacific Ave., Webster Groves, Missouri.

Wanted—The Linnean Society of New South Wales, whose library is the only one in Australia recorded as receiving "Entomological News," is anxious to obtain a copy of the February, 1927, issue to complete its file. A. B. Walkom, Secretary, 16 College Street, Sydney, Australia.

Exchange—Will exchange California specimens for any of your locality. What have you to offer? Correspondence solicited. John Imschweiler, 748 N. Eucalyptus Ave., Inglewood, California.

Wanted—Blues, Coppers, Hairstreaks of all States, also Euchloe genutia. Norman R. Gunn, 1951 Yosemite Road, Berkeley, Calif.

Wanted—Specimens of Psammocharidae, particularly of the subfamily Pepsinae, from North America, Central America and West Indies. Will buy or borrow material for study.—K. A. Salman, Fernald Hall, Amherst, Mass.

Exchange—Pselaphidae and Scydmaenidae from all regions of earth, especially tropics, wanted for cash, exchange, or det: will give collectors going to tropics instructions for collecting them. F. C. Fletcher, 1766 James Ave. So., Minneapolis, Minn., U. S. A.

RECENT LITERATURE

FOR SALE BY

THE AMERICAN ENTOMOLOGICAL SOCIETY

1900 RACE STREET, PHILADELPHIA, PA.

HYMENOPTERA

M-5.—**Cresson** (E. T.)—The types of Hymenoptera in the Academy of Natural Sciences of Philadelphia, other than those of E. T. Cresson. (Memoirs, No. 5, 90 pp., 1928) 2.00

918.—**Bradley** (J. C.)—A revision of the New World species of Trielis, a subgenus of Campsomeris (Scoliidae). (Trans., **54**, 195-214, 1 pl., 1928)..... .45

LEPIDOPTERA.

919.—**Haimbach** (F.)—A list of the species and descriptions of new forms of the American genus Zale, and a new form of Safia (Noctuidae). (Trans., **54**, 215-231, 1 pl., 1928) .40

ORTHOPTERA.

916.—**Hebard** (M.)—Studies in the Dermaptera and Orthoptera of Colombia. Fifth Paper. Orthopterous family Gryllidae. (Trans., **54**, 79-124, 4 pls., 1928)..... 1.00

917.—**Rehn** (J. A. G.)—New or little known Neotropical Blattidae, No. 1. (Trans., **54**, 125-194, 4 pls., 1928)..... 1.50

No Palaearctic section is to be thought of, if Seitz' supplement is not forming part of it.

Each section "Palaearctic Fauna" loses in value without the supplement.

The long expected

Supplementary volume to Section "Palaearctic" of

Prof. Dr. A. Seitz' Work "The Macrolepidoptera of the World"

(in collaboration with famous specialists) has now been taken in hand.

The species, which have been found after completion of the Palaearctic volumes and which therefore are not contained in same, will be mentioned on the plates in the usual exact way as regards text and complete likeness to nature. After making allowance for slight deviations, which may occur during editing, the following may comprise:

Vol. I—Papilionidae,	32-35	pages	of	text,	3	lithographic plates
Pieridae	35	"	"	"	2	" "
Satyridae	40	"	"	"	2	" "
Gen. Erebia	25	"	"	"	1	" "
Nymphalidae	40	"	"	"	3	" "
Lycaenidae	25	"	"	"	1	" "
Hesperidae	2	"	"	"	1	" "

The bulk of the supplement to Vol. II-IV in comparison with the chief vol. coming in question will be about the same as Vol. I. The issue is to appear in single parts or families, so that those interested, will be easily able to acquire this perfectly indispensable supplement. The price for one chromolithographic plate amounts to s. 2.—. Execution and shape of the supplement are adapted to the chief-section.

Kindly order this indispensable supplement.

Stuttgart, Poststrasse 7, Germany. Alfred Kernen, Publisher.

BUTTERFLY TRANSITION FORMS AND "FREAKS" WANTED

WHEN YOU SELL YOUR COLLECTIONS, SELL THESE KINDS OF SPECIMENS SEPARATELY. THEY BRING MORE.

JEANE D. GUNDER,

849 LINDA VISTA AVENUE, PASADENA, CALIFORNIA

Living Cocoons of Saturnia pyri, largest European moth $2.00 dozen, postage 20 cents. British Diurnals in papers, named 100 (50 species), $4.00. List of 700 species of British Lepidoptera free. Fine bred Urania riphaeus $3.00 dozen. Morpho rhetenor, Menelaus, Godartii, etc. Particulars from

A. FORD, 42 Irving Rd., Bournemouth, Hants., England

With permission of Dr. E. Liljeblad

ZOÖLOGICAL DRAWINGS

executed with utmost fidelity in line, stipple or wash. Work from sketches or specimens.

O. LONDON

714 OAKWOOD BLVD., CHICAGO, ILL.

ENTOMOLOGICAL NEWS.

WANTED perfect copies of Nos. 1 and 2 of Vol. 37 (1926) and No. 2 of Vol. 38 (1927). Will give 50 cents apiece.

THE AMERICAN ENTOMOLOGICAL SOCIETY,

1900 Race Street, Philadelphia, Pa.

NEW ARRIVALS

From Colombia, South America:

OVER 10,000 BUTTERFLIES, INCLUDING

Morpho cypris
" sulkowskyi
Morpho amathonte
Caligo spp.

From Cuba:

1500 BUTTERFLIES AND MOTHS, INCLUDING

Papilio columbus
" andraemon
" celadon
" devilliersi
Urania boisduvali
Erinyis guttalaris
Protoparce brontes, etc.

From Venezuela:

Over 5000 Lepidoptera
200 Dynastes hercules

From New Guinea

2000 Coleoptera
200 Orthoptera

From Assam, India:

1200 BUTTERFLIES AND MOTHS, INCLUDING

Papilio arcturus
" philoxenus
Kallima inachis
Brahmaea wallachi

And Many Other Showy Species

From Tibet (Bhutan):

Armandia lidderdalii
Parnassius hardwicki

CATALOGUES OF
ENTOMOLOGICAL SUPPLIES AND SPECIMENS
ON APPLICATION

If interested kindly send your list
of desiderata for further information to

THE KNY-SCHEERER CORPORATION OF AMERICA

Department of Natural Science
G. Lagai, Ph.D.

New York
10-14 West 25th Street